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TO
HER MAJESTY.

SHORT DESCRIPTION

OF THE

SIMULTANEOUS ACTING GATES

FOR

RAILWAY LEVEL CROSSINGS,

WHICH WERE AWARDED THE

GREAT EXHIBITION PRIZE MEDAL,

INVENTED AND MANUFACTURED BY

MESSRS CHARLES D. YOUNG AND COMPANY,

IRON FOUNDERS, ENGINEERS, CONTRACTORS, ETC.

WITH ENGRAVINGS.

Offices.

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REPORT of the JURY of the GREAT EXHIBITION of 1851 in favour of Messrs C. D. YOUNG & Co.'s SIMULTANEOUS ACTING LEVEL CROSSING GATES, for which they had awarded the Prize Medal.

'CLASS V. No. 600. CHARLES D. YOUNG & Co., INVENTORS AND MANUFACTURERS.

'SIMULTANEOUS ACTING LEVEL CROSSING GATES FOR RAILWAYS.—SERIOUS ACCIDENTS 'HAVE ARISEN FROM THE INABILITY OF THE POLICEMEN IN CHARGE OF LEVEL CROSSINGS 'ON RAILWAYS TO OPEN IN TIME ALL FOUR GATES TO GIVE PASSAGE TO AN APPROACHING 'TRAIN. MESSRS YOUNG AND COMPANY'S GATES ARE HUNG ON POSTS SO SET AT THE FOUR 'ANGLES OF A SQUARE OR A RHOMBUS THAT THEY CLOSE EITHER ACROSS THE LINE, AND 'LEAVE THE ROAD CLEAR, OR CLOSE THE ROAD, AND SHUT OFF ALL APPROACH TO THE 'LINE. BY A VERY SIMPLE AND OBVIOUS CONNEXION BENEATH THE GROUND, BETWEEN THE 'HEELS OF THE SEVERAL GATES, BY MEANS OF IRON RODS, THE MOTION OF ANY ONE IS 'ACCOMPANIED BY THE CORRESPONDING MOTION OF THE OTHER THREE DIVISIONS. THE 'POLICEMAN HAS NOT, THEREFORE, TO OPEN AND CLOSE EACH OF THE FOUR IN SUCCESSION, 'BUT BY SIMPLY ACTING ON ONE HE PRODUCES SIMULTANEOUSLY THE REQUIRED MOVEMENT 'IN ALL. THE ADVANTAGES ARISING FROM THIS ARRANGEMENT, WHICH IS AVAILABLE 'EITHER FOR STRAIGHT OR OBLIQUE CROSSINGS, ARE OBVIOUS, WHILE COST OF CONSTRUC-'TION AND MAINTENANCE IS INCREASED ONLY IN A SMALL PROPORTION.'

SHORT DESCRIPTION

OF

LEVEL CROSSING GATES.

The vast extension and development of the Railway System of late years has given an impulse to mechanical invention and improvement quite incredible. Daily experience suggested new ideas, each more comprehensive and grand than before—new principles have been established, and old ones improved upon and perfected—gigantic undertakings, at first laughed at as chimerical, have been conceived, triumphantly carried into execution, and their very consummation become wonders of the age. Notwithstanding this extraordinary progress, the system is only in its infancy, and we cannot but expect for the future great and successful efforts, all tending to the rapid spread of civilization, and to the profitable employment of capital in the development of the resources of the country: Every improvement that can be effected on anything, no matter how insignificant, that has any connection with the system, is a step forward in this direction, and if the improvement relates to any part of the system, tending to give increased security to life and property, or to effect saving either in first cost or in working expenses, the greater is its importance, and the more worthy is it of the careful attention and consideration of Engineers, and of those who have the direction of Railway affairs.

The crossing of roads over Railways upon a level have from the first been a source of much trouble and anxiety to Engineers, while to Companies the expense has been enormous, from the precautions and attendance rendered necessary to prevent accidents. The evils of Level-Crossings are so numerous and so difficult to provide against, that all Engineers have been forced to construct Bridges and Tunnels, where these were practicable, as the only sure way of providing against them; but in many districts of the country local obstacles prevented the erection of such, while, in other situations where these might have

' approach to the line. By a very simple and obvious connexion beneath the ground, ' between the heels of the several Gates, by means of iron rods, the motion of any one is ' accompanied by the corresponding motion of the other three divisions. The Policeman ' has not, therefore, to open and close each of the four in succession, but by simply acting ' on one, he produces simultaneously the required movement in all. The advantages arising ' from this arrangement, which is available either for straight or oblique crossings, are ' obvious, while cost of construction and maintenance is increased only in a small ' proportion.'

With the view of giving a better idea of this important invention, CHARLES D. YOUNG & COMPANY have prepared a full series of engravings shewing the Gates in their various forms and modifications, as applicable to Level Crossings in every possible situation and circumstance; and the following is a short descriptive notice in explanation of each.

CHARLES D. YOUNG & COMPANY may mention that they have at their several places of business working models, both on the square and the skew, and they will be happy at any time to give any further explanation necessary.

PLATE I.

This Plate exhibits an isometrical view of a set of these Gates as they would appear in the course of being opened or shut. To the gate posts wire fencing in iron uprights is connected, but they can be fitted up in any situation, irrespective altogether of the fencing.

Fig. 1 shews the Gates applied to a principal or Turnpike Road Level Crossing upon the skew, opening so as to shut up the line, leaving the communication on the public road complete.

Fig. 2 shews single Gates acting outwards on the same principle, applicable for Parish Road and Field Crossings, and by this means the whole can be opened or shut at pleasure, without the necessity of the gate-keeper crossing the line, who can controul the entire set without the least fatigue.

PLATE II.

This Plate, Fig. 3, exhibits the front elevation of a set of these Gates, shut against the public road, together with a wicket or hand gate for foot passengers, on the right side, and a turnstile for the same purpose on the left, either of which modes can be adopted according to choice.

Fig. 4 is a ground plan of the Gates, and will give a very correct idea of the immense advantage of the tension bars previously described, by means of which the Gates are prevented from being twisted in the slightest degree, on being opened or shut, besides throwing all the weight from the front to the back stiles.

PLATE III.

This Engraving is a representation of the principle applied to Level Crossings of unusual width, as in the case of those on the Scottish Central, the South Yorkshire, and Great Northern, some of which have been 50, 60, and even to the extent of 75 feet wide.

The Signal Plates shewn in the centre are for use in daylight, but for night signals, lamps are fixed in a bracket, as shewn in this figure.

Fig. 6 is the ground plan, shewing the tension bars, and were it not for the advantages of these it would be impossible to make Gates to so great a width.

PLATE IV.

Some engineers prefer single to double leaf Gates, even on wide and important Level Crossings, while in many situations, such as parish roads and field crossings, which are generally narrow, sets of four Gates are quite unnecessary. This principle is therefore shewn in the Plate, modified to suit both circumstances.

These Gates vary from 10 feet and upwards. This engraving exhibits one of the usual width, about 15 or 16 feet. It will be observed the signal plate is in the centre of the Gates, and there are wickets on both sides.

PLATE V.

With the view to suit every possible arrangement and engineering requirement, this Plate presents another form of the same principle.

Several existing lines have all their Level Crossings supplied with wooden Gates on the old method, and the expense of replacing these entirely with new iron Gates upon the simultaneous movement has prevented the engineers and directors from availing themselves of the safety, economy, and other advantages of the system. C. D. Y. & Co. have therefore made arrangements by which existing sets of Gates may be altered to the simultaneous movement, and detailed estimates for which will be furnished on application.

Again, this Plate meets the views of those engineers who prefer wood to iron. The expense, however, of such is fully greater than in iron ; but whether the principal gates are of iron or wood, the side gates or turnstiles have generally been made of the former.

PLATE VI.

This Plate gives a view of a Railway Fence, with wire in wood posts, in the centre of which is laid down a set of Simultaneous Acting Level Crossing Gates, shewing their connexion with signals. The apparatus for this purpose, like that for the movement of the Gates themselves, is of the simplest mechanism, and completely provides against the least possibility of accident through negligence on the part of the gate-keeper at the crossing, which on all lines is the spot where the greatest risk and danger to life and property is incurred. This object is effected by placing ordinary signal-posts on the 'up' and 'down' sides of the line, and that at any required distance from the crossing. On the Signals, and on the back-styles of the Gate next to them, are attached pulleys, connected by means of a double line of wire fixed in the centre of each, so that as the Gates open or shut they work both 'up' and 'down' Signals simultaneously. By this means the state of the Gates at the crossing is at all times perceived by the engineman of the coming train long before he makes up to it, thus affording him ample time to advance slowly, or to stop if necessary, and rendering him totally independent of the gate-keeper in case of neglect, and so removing one of the greatest objections to Level Crossings, while the additional expense is trifling.

PLATE VII.

For Railway Surface Crossings, the ordinary field entrances along the line, and where the Railway divides ground which requires the communication preserved, stronger and larger Gates than the common agricultural class are recommended; and with a view to give a better idea of the superior construction of the Gates manufactured for this purpose by C. D. Y. & Co., and of their peculiar merits, this Plate exhibits one engraved on a large scale. The pillars to which this is usually hung are also shewn, with a ground plan. Gates for such objects on most of the lines already formed have been made of wood, partly because the paling had been so, and partly also because wooden gates were much more easily got than cheap iron ones of good construction. This deficiency, however, is fully met by these, which are so strong as to resist any pressure or usage, and so cheap as completely to supersede those of wood in ordinary use; besides that the principle gives them other advantages intrinsic to themselves, of which gates in the more perishable material are totally incapable.

PLATE VIII.

This is an illustration of the same Gate for field purposes, but is hung to wood posts instead of cast-iron. This Gate is generally preferred, as being more economical, where wood is abundant and cheap, and stone expensive.

PLATE IX.

Plate IX. is a design of a very neat and economical Gate for Railway Stations and other places along a line requiring something better than the ordinary Field Gates.

HIGH LEVEL CROSSINGS.

There is no material so well adapted in point of economy, durability, and efficiency in its application to High Level Crossings of an ordinary character as Iron, and the principle which can give the greatest amount of strength with the least expenditure of material is of course the best.

The two following Plates shew Bridges upon Dredge's Patent Taper Suspension principle, and on the ordinary Tension principle.

PLATE X.

Plate X. is the first of these, viz.—A High Level Crossing Bridge upon Dredge's Patent Taper Chain Suspension principle, (a pamphlet upon which was lately published by C. D. Young and Co., illustrated with diagrams, and which they will be glad to forward on application to any engineer wishing a copy), which can be made guaranteed for any required amount of strain for every description of traffic; and when C. D. Y. and Co. intimate that they are ready to contract for the whole of the bridges of this class required for a railway at an average price of from £160 to £300 overhead, the great advantages of this bridge over those of stone and timber will be obvious.

The elevation shews the foundations built upon the Patent Screw Pile necessary in some situations.

PLATE XI.

This is the common Tension Bridge, and is suitable for many parts of a railway where the Company is bound to furnish bridges for footpaths, but for carriage or cart traffic the other bridge in Plate X. is unquestionably the best in every respect.

Detailed Estimates for these Gates and Bridges for crossings, with every requisite information, will be furnished on application, and C. D. Y. and Co. would take this opportunity of directing the attention of railway engineers and directors to their Treatise, lately published, copiously illustrated with copper-plate engravings, on their system of strained wire fencing for railway and private inclosures, which they will be very happy to supply to any such wishing a copy. They would also solicit notice to their general Price List for IRON CASTINGS, subjoined. The extent of their works, and their favourable position in the iron and coal districts, with a shipping port, enable them to undertake contracts to any extent, and at rates corresponding with the local advantages possessed.

PRICES OF IRON CASTINGS.

Cast-Iron Chairs and Sleepers at the market price for the time being.
Cast-Iron Girders, from £5 : 10s. to £7 per ton, according to specifications.
Do. Columns, from £5 : 10s. to £7 per ton, do.
Do. Water Pipes, from £6 to £8 do. do.
Do. Gas Pipes, from £6 to £8 do. do.
Railway and Engineer's Castings as per special agreement.
Cast-iron Ballusters for gates and railings, as per do.
Cast-iron Stable Fittings, as per do.
Cast-iron Sugar Pans, proved and varnished, from 10s. to 14s. per cwt.
Cast-iron Troughs, every description, from 8s. to 14s. do.
&c. &c. &c.

RAILWAY COMPANIES WHO HAVE ADOPTED MESSRS CHARLES D. YOUNG & CO.'S SIMULTANEOUS ACTING LEVEL CROSSING GATES.

North British Railway Company.
Edinburgh, Perth, and Dundee do.
St Andrews do.
Scottish Central do.
Scottish Midland do.
Caledonian do.
Edinburgh and Hawick do.
Buckinghamshire do.
Lancashire and Yorkshire do.
Liverpool and Bury do.
Shrewsbury, Birmingham, and Shropshire Union do.
Shrewsbury and Stafford do.
Great Northern do.
Birmingham, Wolverhampton, and Stour Valley do.
Leeds and Thirsk do.
Leeds Northern do.
South Yorkshire do.
Waterford and Limerick do.
East Indian do.
Barcelona do.
&c. &c. &c.

A FEW TESTIMONIALS

IN FAVOUR OF

MESSRS CHARLES D. YOUNG & COMPANY'S SIMULTANEOUS ACTING GATES FOR LEVEL CROSSINGS.

From JAMES FALSHAW, Esq., Manager for Messrs JOHN STEPHENSON & COMPANY on the Scottish Central Railway.

Stirling, 26th February 1848.

Gentlemen—Captain Wynne, the Government Inspector, was over the line on Wednesday, and very highly approved of and much admired the Level Crossing Gates you have erected near to Stirling.

I promised to procure for him one of your books, with drawings and descriptions of the several kinds you manufacture.

Will you therefore please forward to the address as under a book similar to the one you sent to me. "Captain Wynne, Railway Department, Whitehall, London."—Yours truly,

JAMES FALSHAW.

EXTRACT from LETTER from WM. BELLINGTON, Esq., Surveyor, Shrewsbury.

I have examined carefully your Simultaneous Acting Level Crossing Gates erected at the Ashton Station on the Ashton Branch of the Lancashire and Yorkshire Railway. They act and work sweetly, and are managed without the least effort or force being required.

They are much approved of in this neighbourhood.

From JAMES BROWNLEE, Esq., C.E., Manchester.

I am happy to state that so far the Gates act very well indeed, and I like their appearance very much.

From JAMES A. TASKER, Esq., C.E. on Scottish Central Railway.

Engineers' Department, Scottish Central Railway Office, Perth, 14th March 1848.

Gentlemen—I have received your favour of the 9th. The Gates you have erected on this line answer the purpose very well; and I am so much satisfied with them that I am now obtaining the necessary information to enable me to order the remainder for the line between Stirling and Perth. I expect to be able to send you particulars of the order to-morrow or next day.—I am, your obedient servant,

JAMES A. TASKER.

From Mr FRANCIS WYTHES, Contractor on the Shropshire Union Railway.

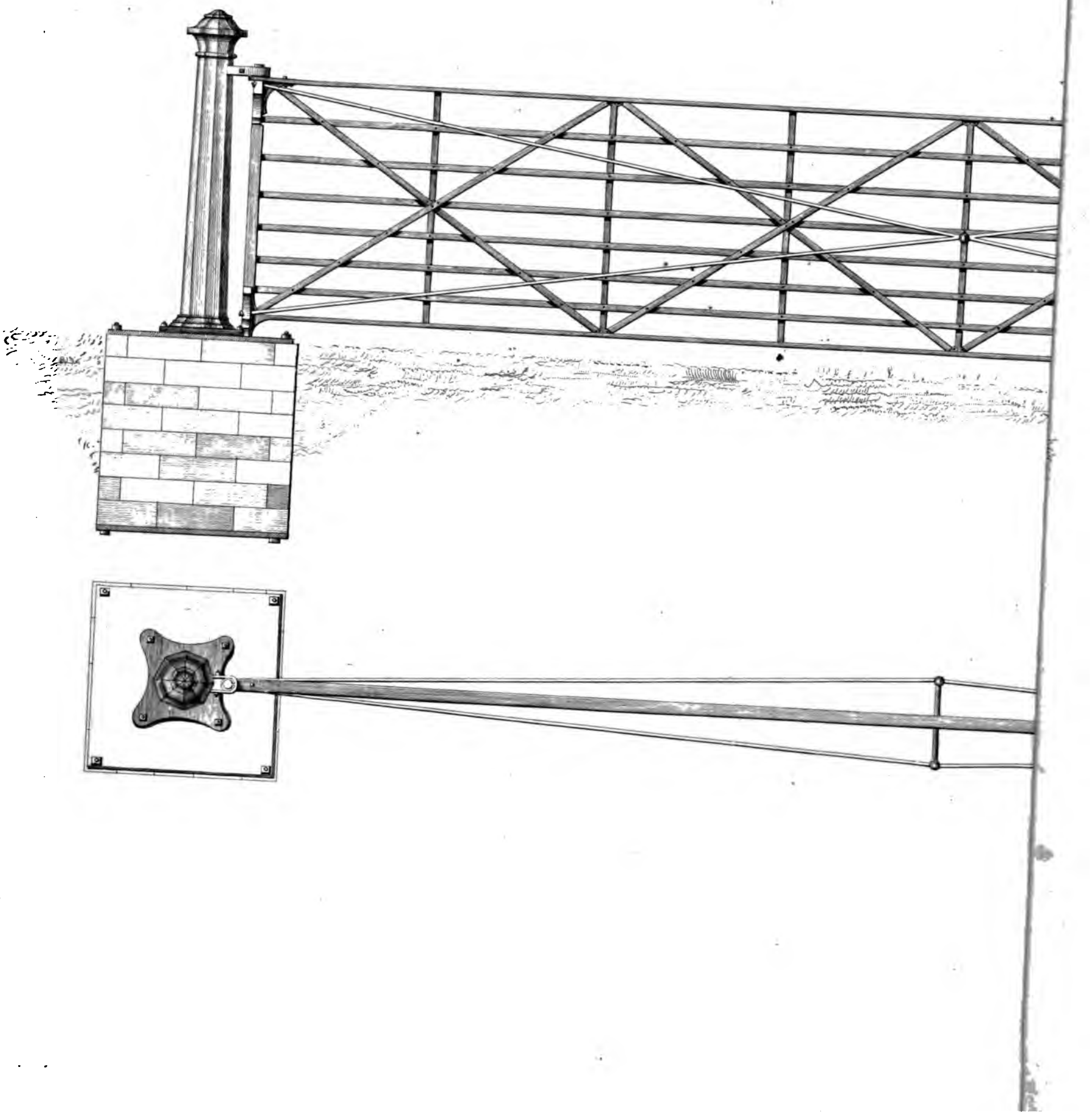
Contractors' Office, Stafford, 4th April 1849.

Gentlemen—Your Level Crossing Gates erected for me on the Shropshire Union Railway work exceedingly well, and they are much approved of by all who have seen them.—I am, Gentlemen, your obedient servant,

FRANCIS WYTHES.

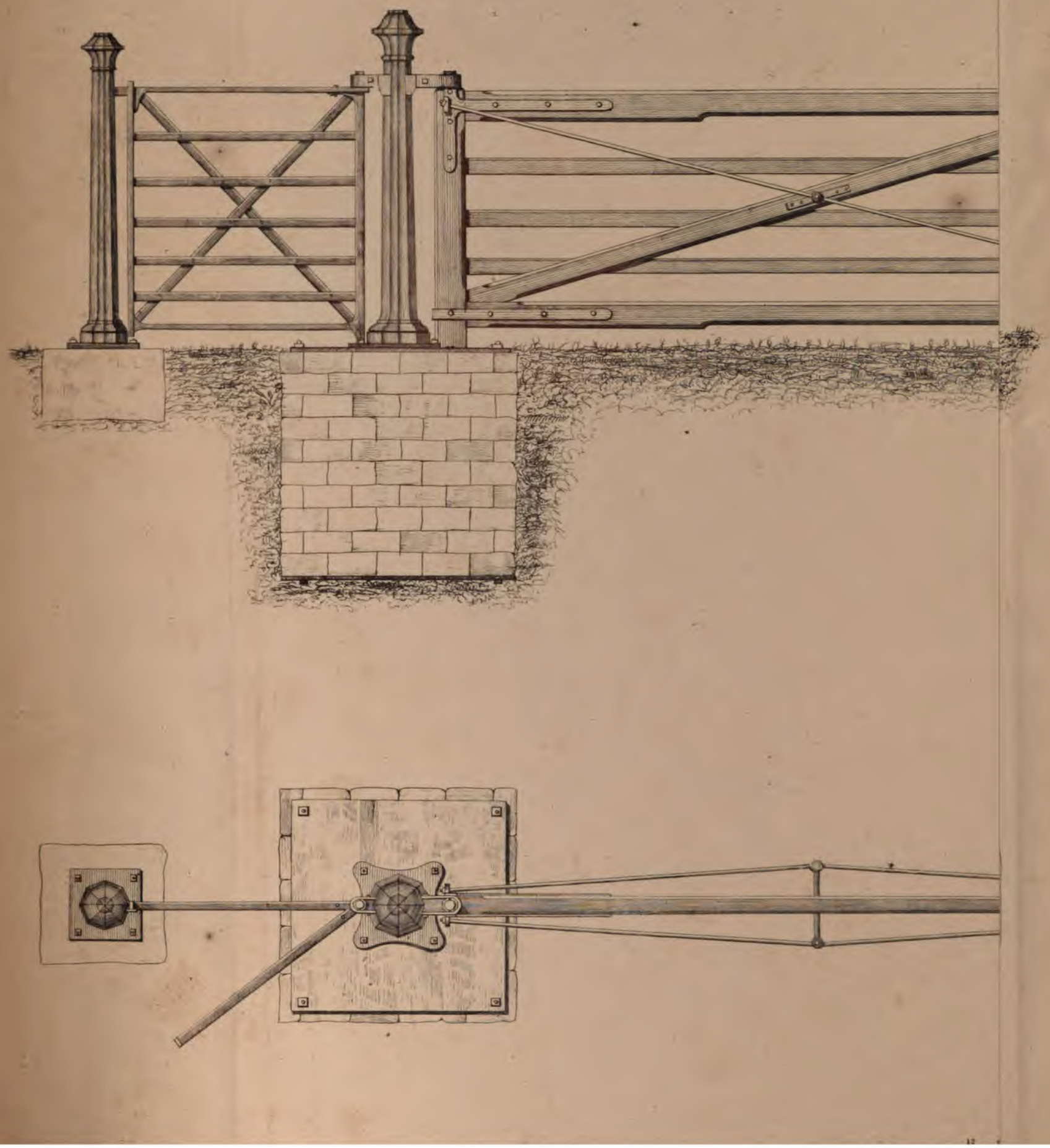
PLATES.

19 GREAT GEORGE ST WESTN
LONDON.



19 GREAT GEORGE St WESTMINSTER
LONDON.

IRON GAT
48 NORTH B



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LONDON.

IRON GATE &

48 NORTH BRIDG

Strong Wrought Iron

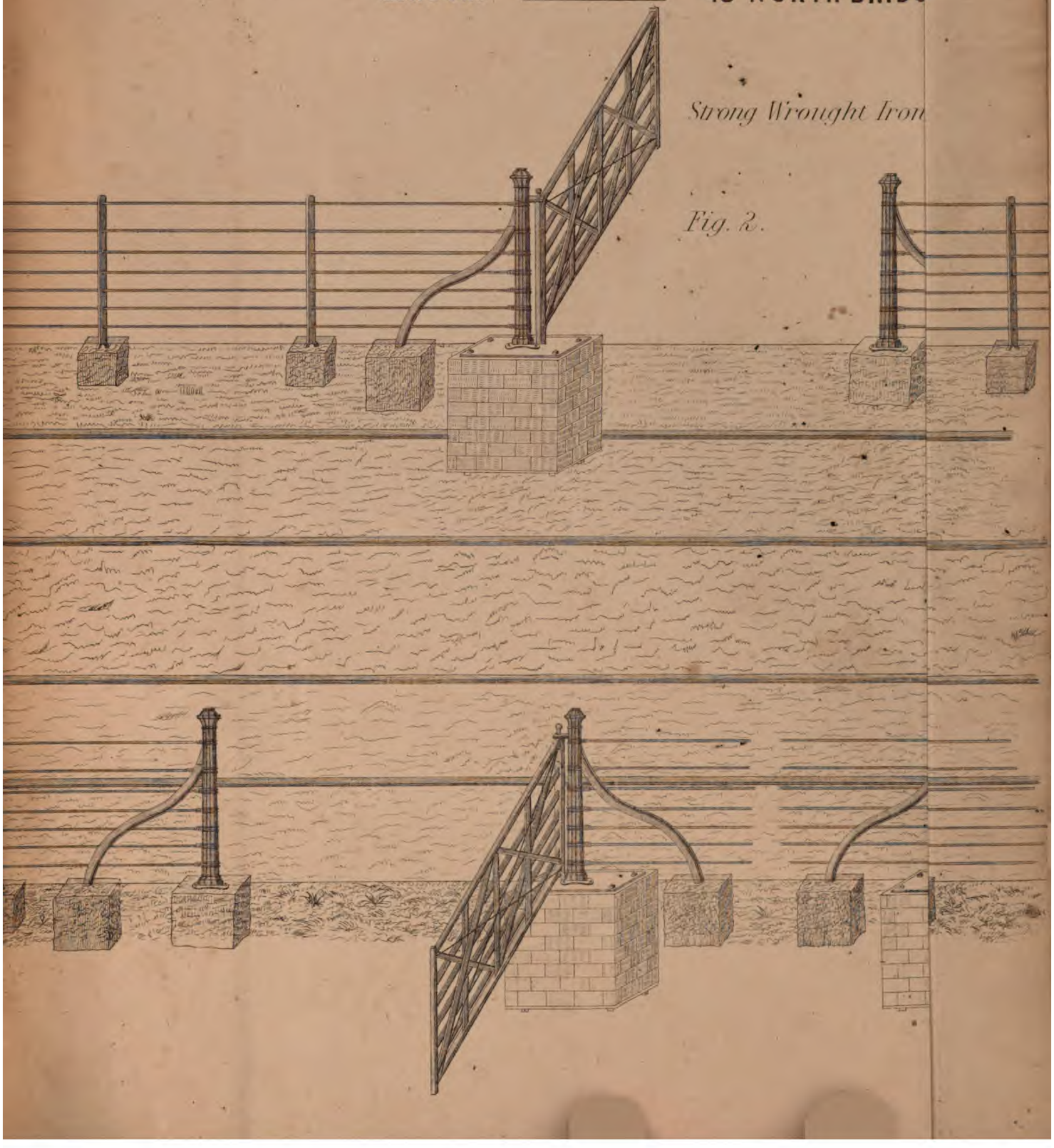


Fig. 2.

PLATE 6

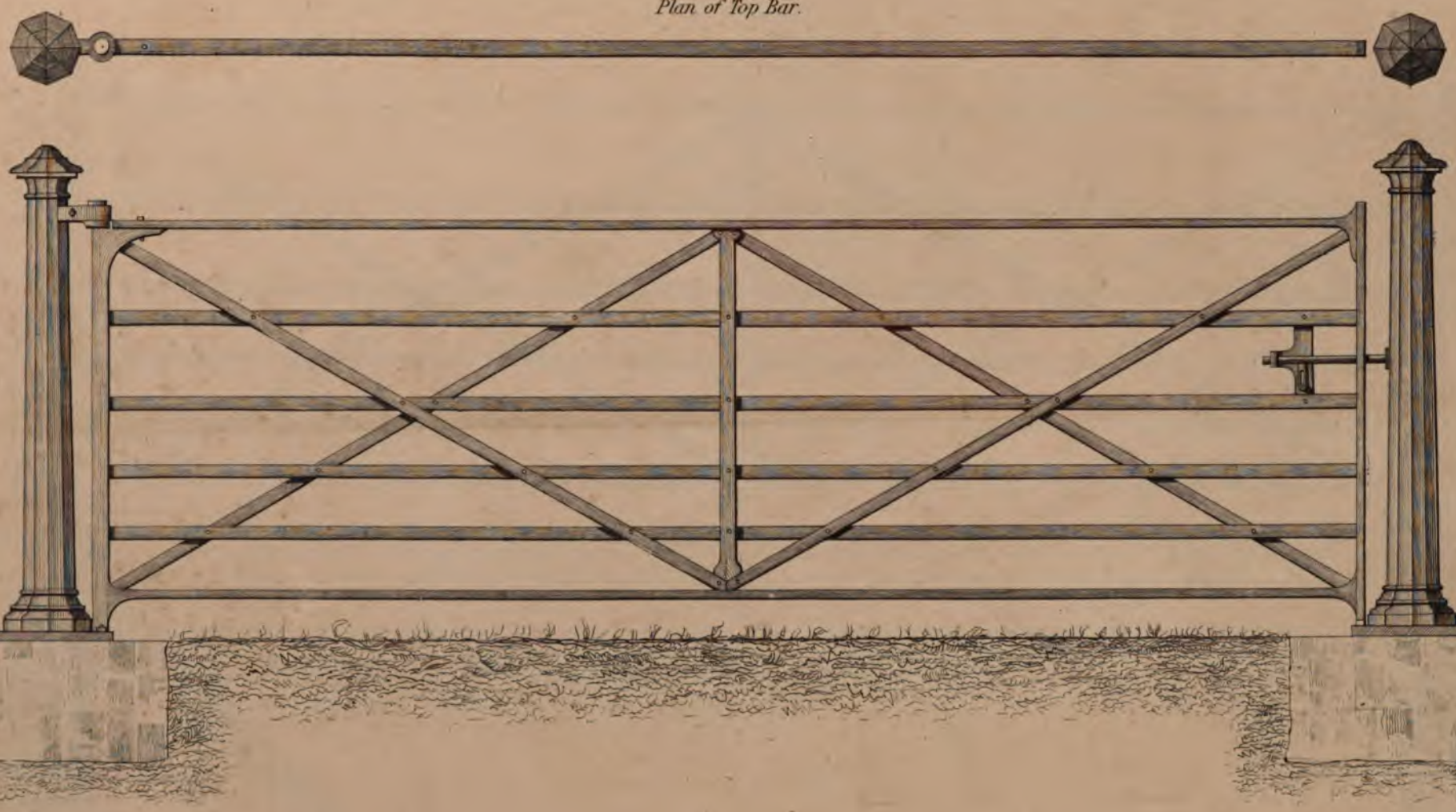
CHARLES D. YOUNG & COMPANY

) GREAT GEORGE St WESTMINSTER
LONDON. ———

IRON GATE & WIRE FENCE MANUFACTURERS & CONTRACTORS
48 NORTH BRIDGE EDINBURGH = 32 St ENOCH SQUARE GLASGOW.

CASTLE BUILDINGS DERBY SQUARE
——— LIVERPOOL.

Plan of Top Bar.



SCALE OF FEET.

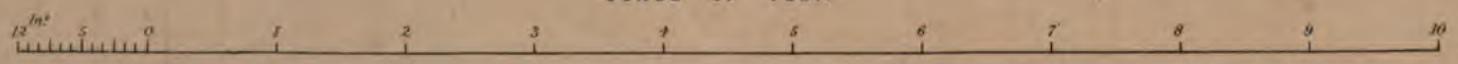
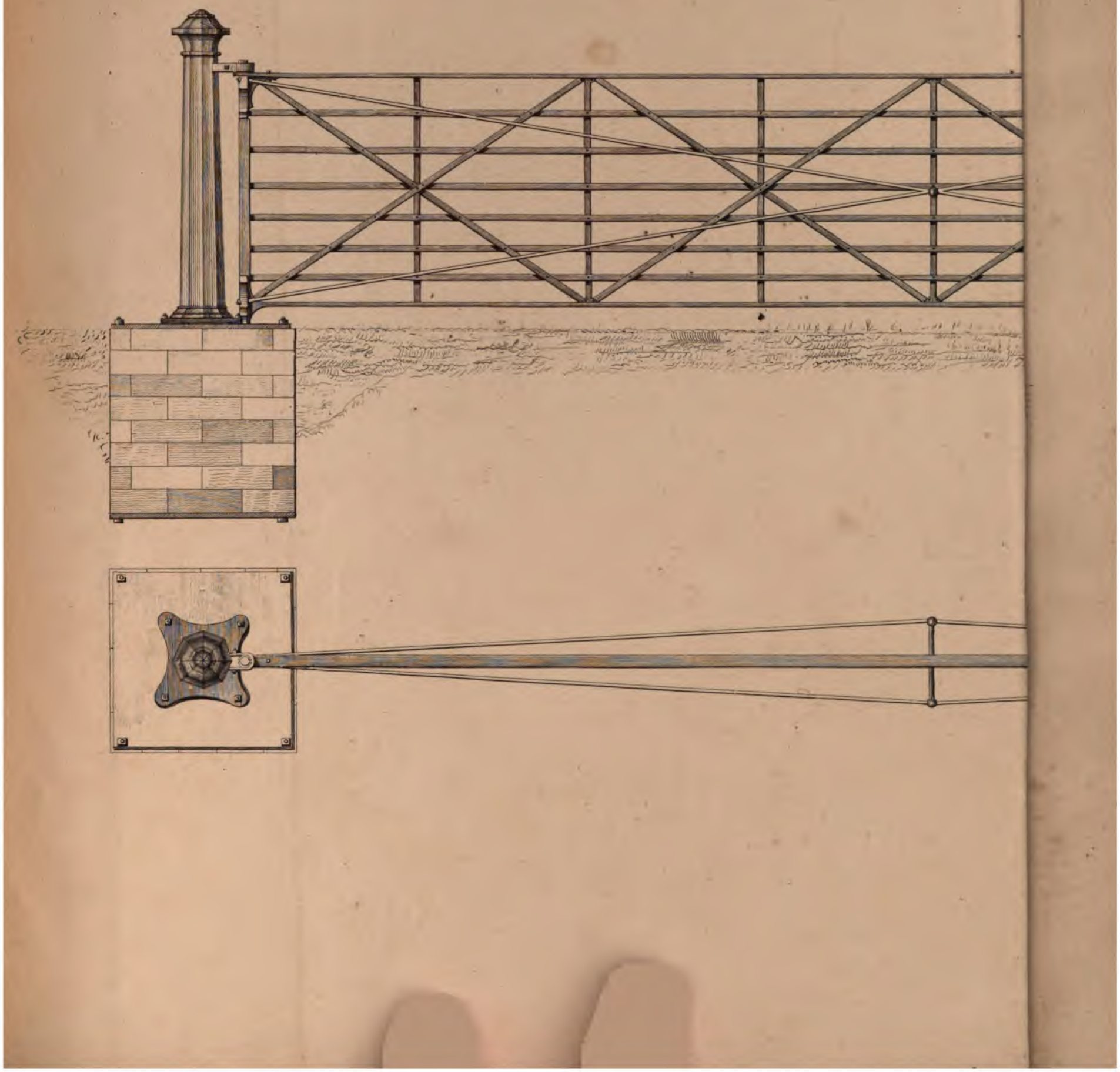


PLATE 7.

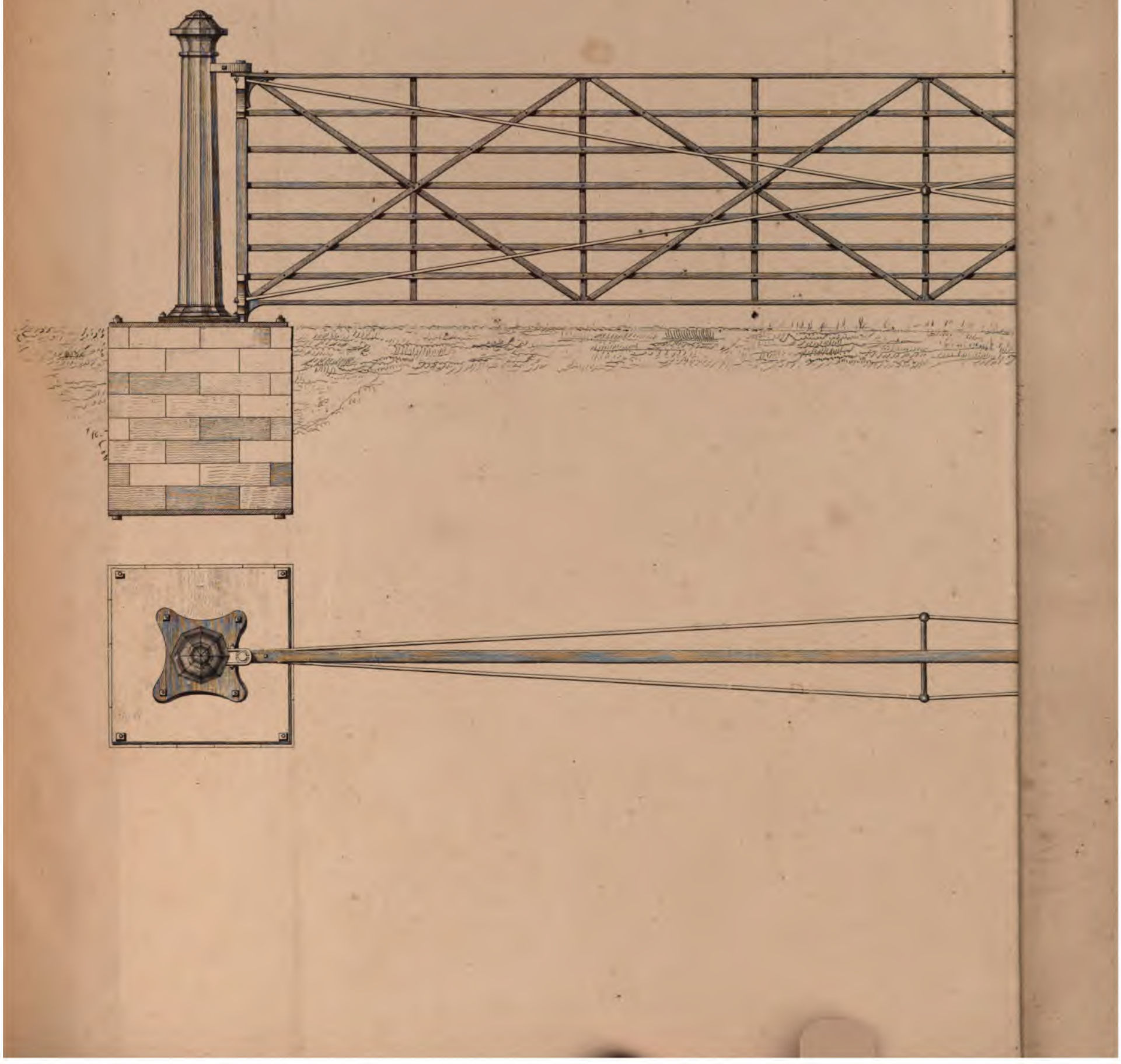
ENGRAVED BY SEATON WARBURTON
ENGINEERING & ARCHITECTURAL ENGRAVER EDINBURGH.

19 GREAT GEORGE ST WESTN
LONDON.



19 GREAT GEORGE S.t WESTN

LONDON. —



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